CLAIMS

1. A liquid crystal display device comprising:

a pair of substrates;

a liquid crystal interposed between the pair of substrates;

a thin film transistor over one of the pair of substrates; and

a pixel electrode connected to the thin film transistor,

wherein the thin film transistor comprises:

a gate electrode formed over the substrate by fusing conductive nanoparticles,

a layer including at least one of silicon nitride and silicon oxynitride formed on and in direct contact with the gate electrode,

a gate insulating layer at least containing a layer comprising silicon oxide over the layer, and

a semiconductor layer over the gate insulating layer.

2. A liquid crystal display device comprising:

a pair of substrates;

a liquid crystal interposed between the pair of substrates;

a thin film transistor over one of the pair of substrates; and

a pixel electrode connected to the thin film transistor,

wherein the thin film transistor comprises:

a gate electrode formed over the substrate by fusing conductive nanoparticles,

a first layer including at least one of silicon nitride and silicon oxynitride formed on and in direct contact with the gate electrode,

a gate insulating layer at least containing a silicon oxide layer over the first layer, and

a semiconductor layer over the gate insulating layer;

a wiring connected to at least one of a source and a drain; and

a second layer including at least one of silicon nitride and silicon oxynitride formed to be on and in direct contact with the wiring,

wherein the wiring formed by fusing conductive nanoparticles.

3. A liquid crystal display device comprising:

a pair of substrates;

a liquid crystal interposed between the pair of substrates;

a first thin film transistor over one of the pair of substrates;

a pixel electrode connected to the thin film transistor;

a driver circuit constructed by a second thin film transistor which comprises the same layer structure of the first thin film transistor; and

a wiring extending from the driver circuit and connected to a gate electrode of the first thin film transistor,

wherein the first thin film transistor comprises:

the gate electrode formed over the substrate by fusing conductive nanoparticles,

a layer including at least one of silicon nitride and silicon oxynitride formed on and in direct contact with the gate electrode,

a gate insulating layer at least containing a layer comprising silicon oxide over the layer, and

a semiconductor layer over the gate insulating layer.

4. A liquid crystal display device comprising:

a pair of substrates;

a liquid crystal interposed between the pair of substrates;

a first thin film transistor over one of the pair of substrates;

a pixel electrode connected to the thin film transistor;

a driver circuit constructed by a second thin film transistor which comprises the same layer structure of the first thin film transistor; and

a wiring extending from the driver circuit and connected to a gate electrode of the first thin film transistor,

wherein the thin film transistor comprises:

a gate electrode formed over the substrate by fusing conductive nanoparticles,

a first layer including at least one of silicon nitride and silicon oxynitride formed on and in direct contact with the gate electrode,

a gate insulating layer at least containing a silicon oxide layer over the first layer, and

a semiconductor layer over the gate insulating layer;

a wiring connected to at least one of a source and a drain; and

a second layer including at least one of silicon nitride and silicon oxynitride formed on and in direct contact with the wiring,

wherein the wiring formed by fusing conductive nanoparticles.

5. The liquid crystal display device according to any one of claims 1 to 4, wherein the conductive nanoparticles comprise Ag.

6. The liquid crystal display device according to claim 2 or 4,

wherein the semiconductor layer comprises at least one of hydrogen and halogen; and

wherein the semiconductor layer is a semi-amorphous semiconductor having a crystal structure.

7. The liquid crystal display device according to claim 2 or 4, wherein the driver circuit comprises only an n-channel type thin film transistor.

8. The liquid crystal display device according to claim 1 or 2,

wherein the thin film transistor comprises the semiconductor layer including hydrogen and halogen and which is a semiconductor having a crystal structure,

wherein the thin film transistor is capable of being operated in electric field effect mobility of from 1 $cm^2/V \cdot sec$ to 15 $cm^2/V \cdot sec$.

9. The liquid crystal display device according to claim 3 or 4,

wherein the first thin film transistor and the second thin film transistor comprise

the semiconductor layer including hydrogen and halogen and which is a semiconductor having a crystal structure,

wherein the first thin film transistor and the second thin film transistor are capable of being operated in electric field effect mobility of from 1 $cm^2/V \cdot sec$ to 15 $cm^2/V \cdot sec$.

10. A liquid crystal television receiver comprising the liquid crystal display device according to any one of claims 1 to 4.

11. A method for manufacturing a liquid crystal display device comprising the steps of:

forming a gate electrode over a substrate having an insulating surface with a droplet discharge method;

laminating a gate insulating layer, a semiconductor layer, and an insulating layer over the gate electrode;

forming a first mask in a position overlapping with the gate electrode with a droplet discharge method;

forming a channel protective layer by etching the insulating layer by using the first mask;

forming a semiconductor layer containing one conductivity type impurity;

forming a second mask in a region including the gate electrode with a droplet discharge method;

etching the semiconductor layer containing one conductivity type impurity and the semiconductor layer;

forming source and drain wirings with a droplet discharge method; and

etching the semiconductor layer containing one conductivity type impurity over the channel protective layer by using the source and drain wirings as masks.

12. A method for manufacturing a liquid crystal display device comprising the steps of:

forming a gate electrode and a connection wiring over a substrate having an insulating surface with a droplet discharge method;

laminating a gate insulating layer, a semiconductor layer, and an insulating layer over the gate electrode;

forming a first mask in a position overlapping with the gate electrode with a droplet discharge method;

forming a channel protective layer by etching the insulating layer by using the first mask;

forming a semiconductor layer containing one conductivity type impurity;

forming a second mask in a region including the gate electrode with a droplet discharge method;

etching the semiconductor layer containing one conductivity type impurity and the semiconductor layer;

partially exposing the connection wiring by selectively etching the gate insulating layer;

forming a source wiring and a drain wiring and connecting at least one of the source wiring and the drain wiring to the connection wiring at the same time; and

etching the semiconductor layer containing one conductivity type impurity over the channel protective layer by using the source and drain wirings as masks.

13. The method for manufacturing a liquid crystal display device according to claim 11 or 12, wherein the step of laminating a gate insulating layer, a semiconductor layer, and an insulating layer over the gate electrode is carried out without exposing to the atmosphere.

14. The method for manufacturing a liquid crystal display device according to claim 11 or 12, wherein the gate insulating film is sequentially laminated by a first silicon nitride film, a silicon oxide film, and a second silicon nitride film.